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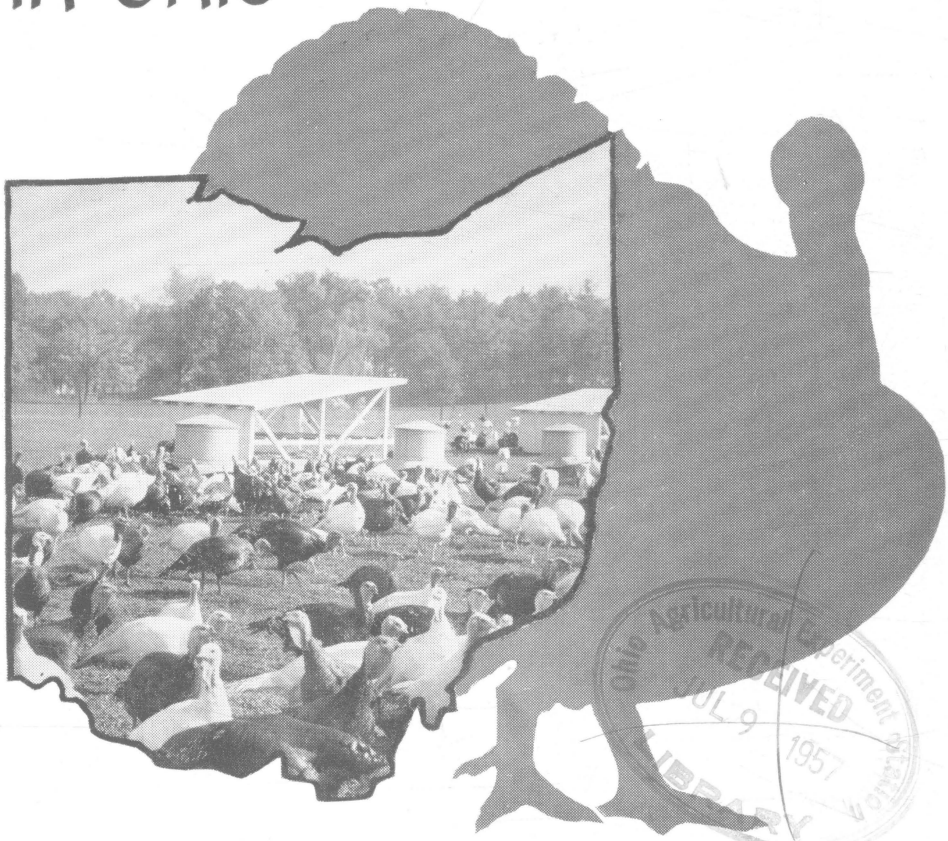
Raising Turkeys in ohio



Agricultural Extension Service
The Ohio State University

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Raising Turkeys in Ohio

By
M. G. McCartney and B. L. Goodman

Turkey production is steadily increasing in Ohio. During the past decade the number of turkeys raised on Ohio farms has increased nearly 150 percent, reaching a total of almost 3 million turkeys in 1955 valued at about 15 million dollars.

Ohio now ranks fifth in importance in turkey production, producing 4.6 percent of the turkeys raised in the United States (Table 1). According to the U. S. Department of Agriculture, the five leading counties in Ohio for number of turkeys raised in 1954 were: (1) Darke; (2) Fulton; (3) Knox; (4) Tuscarawas and (5) Mercer (Fig. 1).

Expansion of the turkey industry has been largely due to increased year around consumption. Turkey is no longer considered just a Thanksgiving and Christmas delicacy, but an economic food available throughout the year.

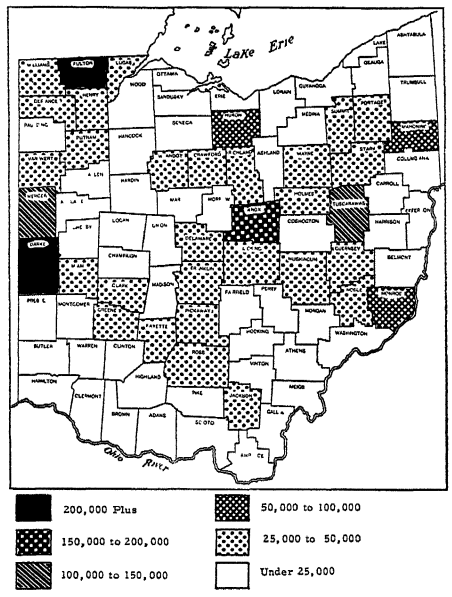


Fig. 1—Distribution of turkeys by counties in Ohio, 1954.

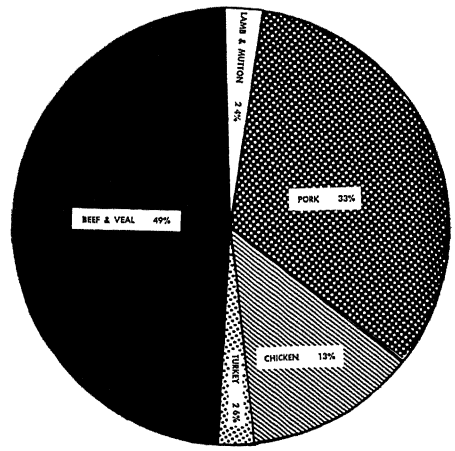


Fig. 2—Per capita consumption of turkey, chicken and red meats. (U.S.D.A. estimates for 1954.)

An adequate supply of turkey available in various sizes (small, medium and large roasters) encourages increased year around consumption. Dressed turkeys are available as fresh killed or frozen, fully prepared and ready to cook, as whole, halves, quarters, or cut-up parts.

Although the consumption of turkey meat is gradually increasing, the per capita is only about 5 pounds a year. There is opportunity for an expanding turkey industry compared to chicken and red meat consumption (Fig. 2). An increase of only 1 pound per capita in consumption would require an additional 15 million

turkeys for the entire country and 700,000 for Ohio.

The future of the turkey industry in Ohio depends upon many factors. Growers in Ohio are close to a large consuming population. However, Ohio growers must produce more economically and increase the quality of their product in order to hold their markets and compete with out-of-state turkeys. To maintain a satisfactory profit, growers must purchase the best quality poults available, employ the most advanced practices of brooding, rearing and feeding, and merchandise a uniformly high quality product.

Starting in the turkey business requires a considerable amount of capital. The cost per turkey started is about $4 to market age, or assuming 10 percent mortality, represents an investment of $4.45 per bird sold. The average cost of producing turkeys, excluding labor, are as follows:

Cost of poult.....	15–20%
Feed	65–75%
Litter, fuel, medications, depreciation on buildings, and equipment.	10–15%

One needs some knowledge and experience to be successful in the turkey business. It is advisable to begin in a small way and develop the business on the basis of year-to-year profits.

There are several ways to make a start in the turkey business, the best of which is probably the purchase of day-old poults. Most commercial turkey growers follow this method. The desired number of poults can be obtained at a specific time by placing an order several weeks in advance.

There should be little danger of diseased poults if one purchases from a reliable hatchery. Many Ohio hatcheries are members of the National Turkey Improvement Plan which is concerned with breed improvement and the control of pullorum and typhoid. All member hatcheries are qualified to sell pullorum-typhoid clean eggs and poults.

The purchase of mature birds to produce eggs for hatching is expensive if good stock is obtained. The number of poults produced at one time will be limited. There is always danger of bringing disease onto the farm with mature birds (a source of infection to the poults).

The purchase of hatching eggs is probably the least expensive but the least desirable. The danger of poor fertility and hatchability, and the problem of incubating the eggs makes this method undesirable.

Selecting a Strain

THE producer should attempt to satisfy demands of his market. Most families prefer a small turkey. Cafes, hotels and restaurants prefer a large turkey. Therefore, the size of turkey to raise is largely determined by the market. Small birds convert feed less efficiently than large birds. The cost to produce a pound of meat is greater and the smaller birds should be sold for a slightly higher price (Table 2).

After determining the size of birds to raise, the producer must choose the strain of birds best suited to his conditions (Table 4). Results of all random sample tests should be considered. Various experiment stations throughout the United States measure the quality of commercial poults for traits such as livability, growth rate, body measurements, hatchability and fertility of the parents and other factors. The results of each test are available to those interested and may be obtained by writing each experiment station. Results are published in many of the popular poultry publications, especially "Turkey World."

Fig. 3—Starting poults in a battery brooder for 10 to 14 days reduces labor and mortality.

Brooding the Poults

THE first step in successful brooding is to provide sanitary conditions. The poults should be reared entirely separate from all ages of chickens and adult turkeys. Before the poults are placed in the brooder house, the walls and floors of the house and all equipment should be thoroughly cleaned and disinfected.

Brooder houses for poults are generally either small colony houses or long, continuous houses consisting of several pens. For the small operator, the colony house is satisfactory. Colony houses and brooders used for brooding chicks can be used for brooding poults, if thoroughly cleaned and isolated from chickens. A 10 by 12-foot house will accommodate 125 poults to 8 weeks of age. About 1 square foot of floor space per poult is adequate for best results during the brooding period. After 8 weeks of age, the poults no longer require heat, and the colony house can be moved to range where the turkeys remain until market time.

Commercial turkey growers prefer continuous brooder houses which vary from 30 to 40 feet in width and 100 or more feet in length. These houses are usually divided into several pens, accommodating 300 to 400 poults in each pen. However, some growers brood poults in continuous houses without partitions. Poults brooded in continuous brooder houses are generally moved to range at 8 weeks of age.

The pole-type house has met with a great deal of favor with many growers. These structures are relatively inexpensive and are being used by some growers for both brooding and rearing turkeys in confinement to market age.

Some turkey growers prefer battery brooders for starting poults. The poults seem to learn to eat and drink sooner than when brooded on the floor (Fig. 3). For successful battery brooding, a well-lighted and properly ventilated room is essential. Battery brooders are fairly expensive. The average turkey grower probably should not invest in them unless poults are started several times during the year.

Brooders of good design, heated by gas, oil or electricity, are used for brooding poults in colony houses (Figs. 4 and 5). When selecting a brooder stove, buy one that is well made, equipped with a temperature regulator and operates on the

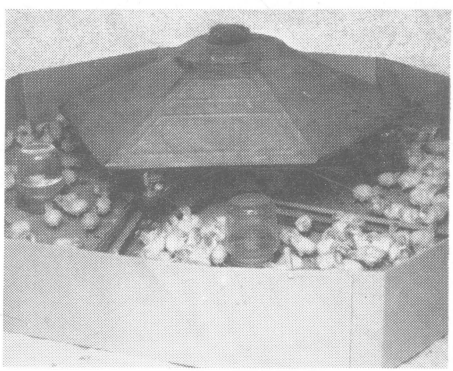


Fig. 4—A gas-heated brooder with guard and plenty of feeders and waterers.

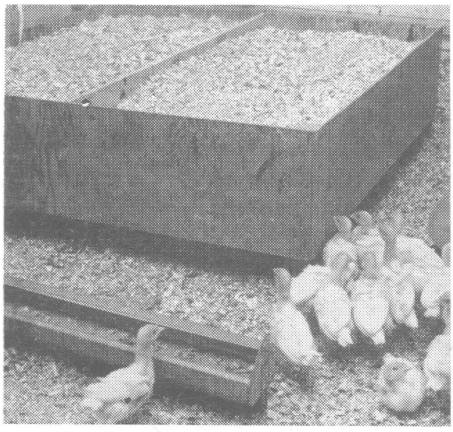


Fig. 5—A home-made hover type electric brooder. This brooder uses two 125-watt heat lamps.

cheapest of fuel available. A brooder stove with a 60-inch canopy is large enough to accommodate 150 to 200 poults. Brooder stoves also can be used in a continuous brooder house where supplementary heat is available to maintain room temperature at 60 to 70° F. during cold weather.

Hot water brooding systems are usually used in continuous brooder houses. This system consists of a series of 1½ to 2-inch pipes running the entire length of the house. The pipes are placed 3 to 4 inches apart, 12 to 16 inches from the floor. A canopy is placed over the top of pipes in each pen and the heat from the pipes radiates downward over the poults. The hot water which flows through the pipes is provided by a boiler located in the center or at one end of the building (Fig. 6).

Each system of brooding has its advantages and disadvantages. The brooding system selected depends upon the fuel available and the cost of operation. The brooding equipment should be checked and in operation at least 48 hours in advance of arrival of the poults. The tem-

Fig. 6—A hot water brooding system with 1½-inch pipes 1½ inches apart vertically. A canopy is placed over the pipes to direct the heat downward during the brooding period. This type of hot water system is not as common as the type with the pipes placed horizontally 12 to 16 inches from the floor.

perature should be 95° F. at the edge of the hover, 2 inches above the floor and reduced 5 degrees a week until a temperature of 70 to 75° F. is reached by about the fourth or fifth week, where it is maintained until the end of the brooding period.

Adequate feed and water space must be available at all times. During the first 8 weeks, each poult should be provided with 1 to 2 linear inches of feeder space. One 1-gallon waterer should be provided for each 50 poults during the first 4 weeks. At 4 weeks of age, change to large water fountains or automatic waterers. One 3-gallon fountain is adequate for 100 poults to 8 weeks. Feeders and waterers must be replaced with larger ones, as the poults grow, to provide a constant supply of feed and water at all times.

Roosts are not necessary in the brooder house. Some growers, however, provide 1 by 4 inch material laid flat as roosts at 3 to 4 weeks of age.

Clean litter, such as shavings or ground corn cobs, to a depth of 3 or 4 inches should cover the floor of the brooder house. It is not necessary to cover the litter, providing the poults are fed and watered as soon as they are placed in the house.

A starting ration should be fed during the first 8 weeks. The starting ration should contain 26 to 28 percent protein and may be fed in the form of mash or crumbles. The ration should be medium-high in energy and contain the recommended levels of vitamins and minerals to support maximum growth. The 26 percent protein starting ration shown in Table 5 is recommended by the Ohio State University (Ohio Agricultural Extension Bulletin 343).

Many turkey growers prefer to start poults on a good commercial starter. If this is done, feeding instructions that accompany the feed should be followed.

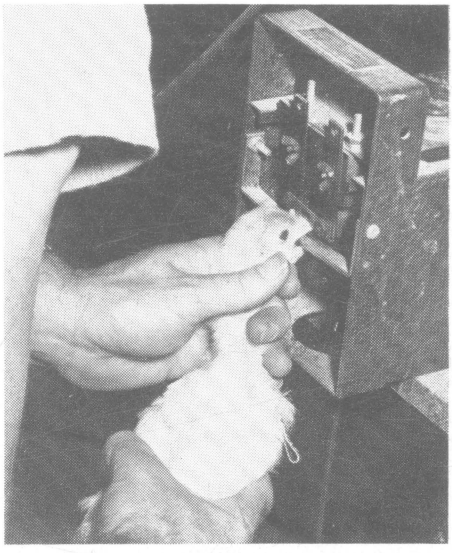
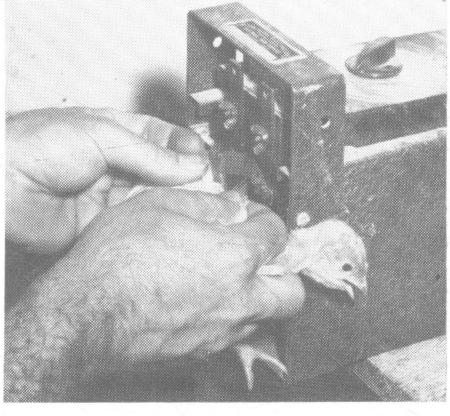


Fig. 7—An electric debeaker being used: (above) to remove half of the upper beak and (below) to cut off the last joint of the wing.

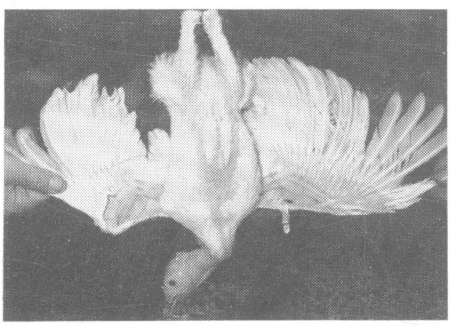


Concentrate mash can be purchased and mixed with homegrown grains.

Debeaking to prevent cannibalism is recommended at 3 to 4 weeks of age. At least one-half of the upper beak is removed with an electric debeaker, which cauterizes the severed beak and prevents bleeding. Cannibalism can also be stopped by inserting a hog ring in the nostrils and between the upper and lower beak (Fig. 7).

Wing clipping to prevent flight should be done during the first 3 weeks. Poults are wing clipped by cutting one wing off through the last joint. The wound may be cauterized with an electric debeaker to prevent excessive bleeding (Fig. 8).

Fig. 8—A debeaked poult (above) and a wing clipped poult (below).



Desnooding of day-old poults is practiced by some growers to prevent injury among mature males while fighting. It is believed this practice is effective in checking the spread of erysipelas in the flock.

Coccidiosis is a protozoan disease affecting the ceca and the lower part of the intestinal tract (Table 3). The presence of a milky-white substance in the lower part of the intestinal tract is a fairly good indication of coccidiosis. Coccidiosis most commonly affects poults during the brooding period between 2 and 6 weeks of age. Sulfaquinoxaline is probably the most effective coccidiostat for the prevention of the disease. A starter ration containing the preventative level of the drug should be fed during the entire brooding season.

Infectious sinusitis is a disease having two forms, one affecting the sinuses around the nasal passages and the other the lungs and air sacs (Table 3). Both forms occur frequently during and after the brooding period. The sinus form can be treated fairly effectively by injecting each sinus with 10 mg. of streptomycin dissolved in ½ cc. of water. The air sac form does not respond to treatment nearly as well. The most common treatment is the addition of 200 to 300 grams of terramycin or aureomycin per ton of feed for 1 to 3 weeks.

Rearing the Turkeys

TURKEYS can be raised successfully either in confinement or on range after 8 or 10 weeks of age when heat is no longer needed by the poults. If properly managed, either system is satisfactory. The choice depends upon the land and equipment available.

Range rearing is desirable when an abundance of succulent pasture is available throughout the entire growing period. Turkeys receiving a complete growing ration will consume large amounts of pasture, thereby saving as much as 10 to 15 percent of the feed costs. Ladino clover, bluegrass and orchard grass make satisfactory pastures for turkeys

The amount of range required for turkeys depends upon the quality of the pasture, weather conditions, prevalence of diseases and the type of soil. In general, one acre of good range provides adequate pasture for 100 turkeys to market age.

If unlimited range is available, it is good practice to follow a 3-year rotation to re-

duce losses from blackhead. However, where the amount of range is limited, turkeys can be raised on the same range for several years without excessive blackhead mortality by following proper range management. Where limited range is available, the equipment, including shelters, feeders and waterers must be moved often to prevent contamination and resulting mortality.

Range shelters are needed for early hatched poults (Fig. 9). The shelters should be constructed to give the birds protection from the weather and so they can be easily moved with a tractor. After the turkeys become acclimatized they can roost in the open on portable roosts or on the ground. Roosts of 2 by 4 inch material are laid flat and set about 20 inches apart. The shelter and roosts should be constructed to prevent the turkeys from getting into the droppings. An 8 by 14 foot shelter will accommodate 100 turkeys to market age.

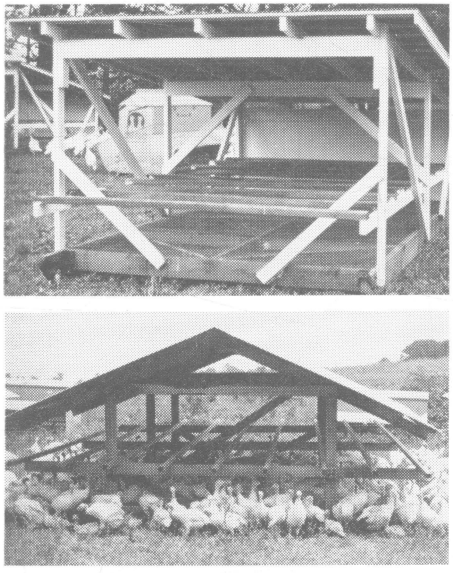


Fig. 9—Two types of range shelters which provide protection and roosting space for approximately 100 turkeys.

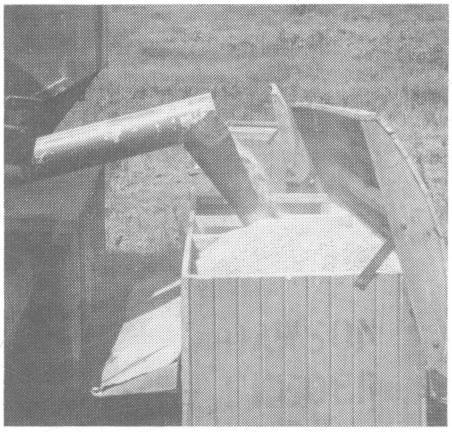


Fig. 10—A bulk truck filling feeders on range.

Feeders for turkeys on range should be constructed for easy moving and filling, to prevent wastage and to keep the feed dry during rain storms (Fig. 10). Many types of commercial and homemade feeders meet these requirements. Approximately 15 to 20 feet of feeder space are required for each 100 turkeys after 8 weeks of age.

Watering systems for turkeys on range should be easily movable. Automatic waterers require less labor. Water pipes laid on the ground and several automatic waterers connected to the water line by hoses make a good system. Or, a portable supply tank can be used to fill large tanks to which several automatic washers are connected (Figs. 11 and 12).

Plenty of water space should be provided and water kept available at all times, especially if adequate shade is not available during periods of extremely hot weather. Clean, fresh water is an inexpensive but very important part of a turkey's diet. Both feeders and waterers should be close together and easily movable.

Confinement rearing is becoming increasingly popular in Ohio, especially

since the development of pole shelters (Figs. 13, 14 and 15). The building site must be well graded to prevent water draining into the house. The doors should be large enough to admit a manure spreader for cleaning. One or two sides of the shelter should have solid covering for protection against storms. Welded wire fencing can be used for the other sides. The floor is usually dirt, sand, cinders or asphalt.

Shelters are usually 40 by 50 feet wide and vary in length from 100 to 300 feet. The turkeys are confined to the shelter from the time they leave the brooder house until marketing time.

Depending upon the size of the turkeys, 3 to 5 square feet of floor space are required for each bird. Feeder and waterer requirements are the same as for turkeys reared on range. However, this equipment need not be portable and bulk feeding systems and automatic waterers should be utilized to reduce labor.

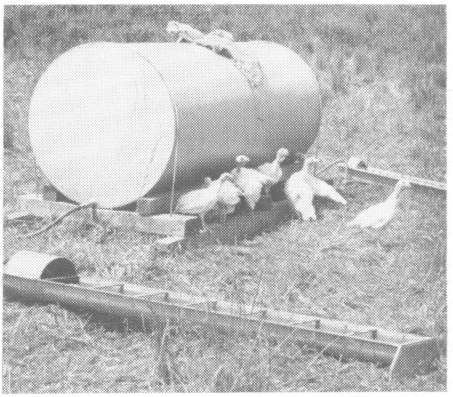


Fig. 12—An automatic watering system on range with large storage tank.

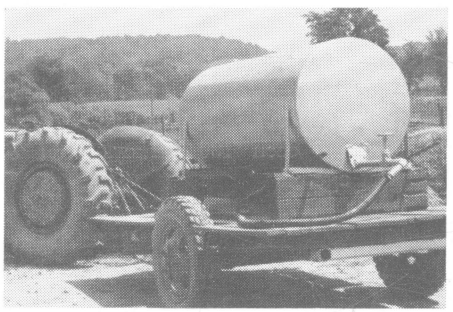


Fig. 11—Tractor and trailer equipped with tank for delivering water to range.

Porches for rearing turkeys in confinement are less used today than several years ago. Many growers, however, are still using this system fairly successfully. The porches consist of a shelter with slatted floors built 4 to 8 feet from the ground to allow space for cleaning underneath. Feed and water are supplied either inside or outside the porch, depending on the height of the structure (Fig. 16).

Growing rations for turkeys on range or in confinement generally include mash or pellets and whole grains fed free-choice.

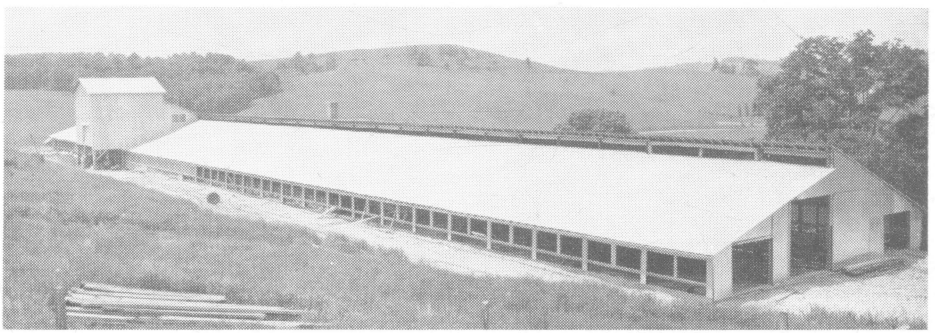


Fig. 13—A large commercial pole shelter 56′ x 384′ with feed storage and boiler room located in the center of the building. Capacity of this shelter is 4,000 to 5,000 turkeys.

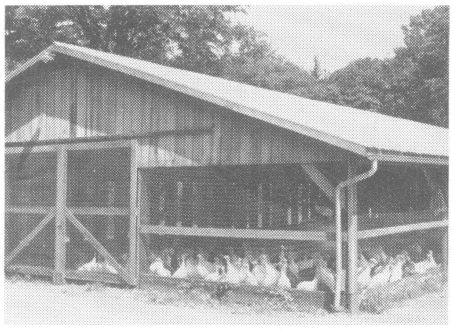


Fig. 14—A pole shelter 39' x 126' with a capacity of 800 to 1,000 turkeys.

The Ohio Turkey Starter can be used as a growing ration by feeding whole grains and mash free-choice. For maximum growth with mash and grains free-choice, turkeys require medium energy rations containing 24 percent protein from 8 to 16 weeks of age and a 20 percent protein ration from 16 weeks to marketing time.

The all-mash or pellet system of feeding can be used for turkeys where home-grown grains are not available. High energy rations containing 20 percent protein to 16 weeks and 16 percent protein from 16 weeks to market age are required for maximum growth with this system of feeding.

Turkeys on good succulent range from 16 weeks to market age grow well on mashes containing little or no added protein or vitamin concentrate, but the recommended levels of minerals must be maintained. Feed costs can be reduced as much as 20 to 25 percent by the use of inexpensive "pasture rations," providing highly palatable clover or grasses are available throughout the entire growing period.

Either mash and grain or all-mash system of feeding can be used to feed turkeys on range or in confinement. Turkey growers mixing their own rations should keep up to date on their feeding program, because our knowledge of the nutrition of turkeys is constantly being improved.

Blackhead is one of the most important diseases causing mortality in turkeys. It is an infectious protozoan disease affecting the liver, intestines and ceca (Table 3). Turkeys suffering from this disease appear unthrifty, having enlarged ceca filled with bloody, cheese-like exudate. The liver is enlarged and may be covered with grayish or yellowish-green spots.

The first step on controlling blackhead is to follow a strict sanitation program to avoid contamination of ranges, houses and equipment. Turkeys should never be raised near chickens because cecae worm eggs in the droppings of chickens contain the blackhead organism.

Several drugs, including 2-acetylamino-5-nitrothiozole (Enheptin A) and, furazolidone (NF-180), and 4-nitrophenylarsonic acid (Histostat) are fairly effective in preventing and controlling blackhead. These drugs can be administered through the feed or in the drinking water, providing they are water soluble. Administration in the feed or water can be either at a preventative level by continuous use or at a treatment level for a certain time when the disease appears. Follow recommendations of the manufacturer of the drug

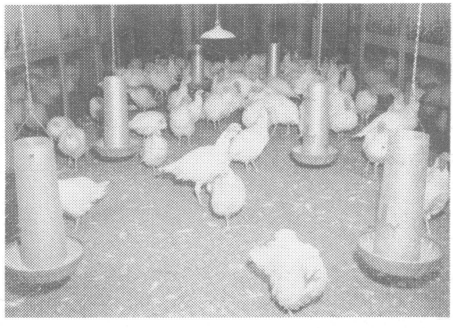


Fig. 15—These turkeys were placed in the pole shelter in November to be grown out for the Easter market.

Fowl pox is more prevalent in some areas than in others, but may appear at any season of the year (Table 3). Turkeys of all ages are susceptible. Any grower who has had a previous outbreak or is in an area where fowl pox is prevalent should vaccinate. Since outbreaks of fowl pox most frequently occur during the fall and winter months, market turkeys should be vaccinated at 14 to 16 weeks of age. Any birds held over as breeders should be re-vaccinated after the market birds have been sold or prior to the breeding season.

Vaccinate with fowl pox vaccine by either the follicle or stick method. The stick method is most popular and involves applying the vaccine to the leg of the bird with a double-needle instrument usually furnished with the vaccine. Examine a few of the birds 7 to 10 days after vaccination for "takes" which are recognized by two small scabs and a distinct swelling at the site of the vaccination.

A natural infection usually appears in only a few birds and can be easily recognized by the appearance of yellow, smooth nodules varying in size on the head and sometimes on the feet and legs of the birds. Also, patches of cheesy, cankerous exudate may be found in the mouth. Infected birds should be immediately removed from the flock and isolated. There is no treatment for a natural infection; the disease must run its course. A grower having several flocks ranged or housed separately should vaccinate the flocks not showing a natural outbreak. The disease usually spreads very slowly and in this way the other flock can be protected from a natural infection.

Marketing Turkeys

THE turkey has been primarily a holiday bird. A major part of the turkey crop is consumed during Thanksgiving, Christmas and New Year holidays, although there has been an increased tendency to spread the marketing of turkeys through more months. During 1954, half of the turkeys were marketed at other than the Thanksgiving and Christmas seasons.

Fig. 16—An inside view of a rearing porch.

The age to market turkeys will be determined by the variety of birds produced. Small varieties such as Beltsville Small White should be ready for market at 22 to 24 weeks of age, whereas 24-28 weeks will be required for the large varieties.

Females will mature approximately 2 to 3 weeks earlier than the males. Regardless of the age, the birds should not be marketed until they are well-fleshed, have a good covering of fat and are free from pinfeathers. The condition of the skin (thickness and color) gives an indication of finish. Birds with fat showing under the breast and the inner surface of the wings indicate that the birds are ready for market.

The presence of small pinfeathers in these areas may indicate that the birds are not ready for market.

Suggestions for dressing, eviscerating, cooling, packaging, freezing and storage of poultry, including turkeys, are given in Ohio Extension Bulletin 344.

TABLE 1.—Turkey Production in United States and Ohio[1]

Year	Numbers Raised		% Total of U. S. production	Ohio rank in production
	U. S. (000)	Ohio (000)		
1946	40,142	1,155	2.9	11
1947	33,975	1,213	3.6	8
1948	31,541	1,031	3.3	11
1949	41,266	1,186	2.9	11
1950	43,792	1.305	3.0	11
1951	52,476	1,565	3.0	10
1952	60,868	1,878	3.1	9
1953	57,141	1,972	3.4	6
1954	65,945	2,960	4.5	5
1955	63,066	2,871	4.6	5

[1] According to estimates by U S. Agriculture Marketing Service.

TABLE 2.—Growth Rate and Feed Consumption for Turkeys[1]

Age in Weeks	Broad Breasted Bronze			Beltsville Small White		
	Av. wt both sexes (lbs)	Feed per lb. gain for each week (lbs)	Cumulative required (lbs)	Av. wt both sexes (lbs)	Feed per lb. gain for each week (lbs)	Cumulative required (lbs.)
0	.12			.11		
1	.28	1.2	.19	.22	1.4	.15
2	.55	1.3	.56	.40	1.7	.45
3	.90	1.5	1.17	.60	2.3	.9
4	1.40	1.6	2.05	.90	2.7	1.7
5	2.0	1.7	3.3	1.2	2.7	2.5
6	2.7	1.8	4.8	1.5	2.7	3.3
7	3.5	1.9	6.6	1.9	2.8	4.4
8	4.3	2.1	8.9	2.4	2.8	5.8
9	5.2	2.3	11.8	3.0	2.8	7.4
10	6.2	2.5	15.0	3.6	2.8	9.0
11	7.3	2.6	18.6	4.2	2.8	10.7
12	8.4	2.7	22.5	4.9	2.8	12.7
13	9.5	2.8	26.5	5.8	3.0	15.1
14	10.6	2.9	30.5	6.6	3.4	17.8
15	11.7	3.0	34.7	7.3	4.0	20.6
16	12.8	3.1	39.1	8.0	4.3	23.6
17	13.9	3.2	43.7	8.7	5.0	27.1
18	14.9	3.3	48.5	9.3	6.8	30.6
19	15.9	3.4	53.4	9.7	10.5	34.1
20	16.8	3.5	58.4	10.0	14.5	37.6
21	17.7	3.6	63.8			
22	18.6	3.7	69.3			
23	19.5	3.8	74.9			
24	20.4	4.0	80.5			
25	21.3	4.1	86.2			
26	22.1	4.2	92.0			
27	22.8	4.4	99.4			
28	23.5	4.6	107.2			

[1] Courtesy, January 1956, Turkey World.

Table 3.—Turkey Disease Prevention and Treatment Chart

Symptoms and Age Affected	Disease and Cause	Prevention	Treatment
Weakness, unthrifty, drooping heads and sagging wings, diarrhea and pasting (1 to 4 wks.)	Pullorum Disease (bacteria)	Buy poults and eggs from pullorum-free stock	Isolate infected poults and treat with sulfa drugs or furazolidone, according to manufacturer's directions. Do not use as breeders
Weakness, sleepiness, ruffled feathers, sagging wings, diarrhea (1 to 4 weeks)	Paratyphoid infection (bacteria)	Buy poults and eggs from stock known to be free from this disease	Treat infected poults with sulfa drugs or furazolidone, according to manufacturer's directions. Do not use as breeders
Heavy breathing, gasping (1 to 8 weeks)	Aspergillosis (mold)	Use clean, dry, mold-free litter and feed	No satisfactory treatment
Gasping and/or nervous symptoms, twisting of neck (1 wk. and older)	Newcastle Disease (virus)	Vaccinate in areas where the disease is prevalent in turkeys	No effective treatment
Nasal discharge, swollen sinuses, coughing and labored breathing (3 wks. and older)	Infectious Sinusitis or PPLO Infection (virus-like organism)	Keep healthy birds away from affected birds	*Sinus Form*—inject each sinus with 100 mg. streptomycin dissolved in ½ cc. of water *Air Sac Form*—add 200 to 300 gms. terramycin or aureomycin to each ton of feed for 1 to 3 weeks
Listlessness, ruffled featherless, drooping wings, brownish droppings (3 to 12 wks.)	Coccidiosis (protozoa)	Keep poults away from adult turkeys; keep brooder house and litter clean and dry	Use sulfaquinoxaline in feed at preventative levels. Follow manufacturer's recommendations

Table 3.—Turkey Disease Prevention and Treatment Chart—(Continued)

Symptoms and Age Affected	Disease and Cause	Prevention	Treatment
Droopy, ruffled feathers, sulfur-colored droppings (4 wks. and older)	Blackhead or Infectious Enterohepalitis (protozoa)	Keep poults away from chickens and adult turkeys. Sanitation and rotate equipment frequently on range	Use proven histomonastats either at preventative or treatment level. Follow manufacturer's recommendations.
Hot, swollen hocks, abscesses on feet, loss of appetite, droppings watery (4 to 24 wks.)	Staphylococcosis (bacteria)	General sanitation recommendations for all infectious diseases	No satisfactory treatment known
Swollen snood on males; discoloration of parts of face, droopy (20 wks. and older)	Erysipelas (bacteria)	Keep birds away from hogs and sheep and from ground used by these animals. Vaccinate flock with bacterin	Intramuscular injection of penicillin or streptomycin
Small, yellow scabs on head. Yellow cankers in mouth and eyes (20 wks. and older)	Fowl Pox (virus)	Vaccinate at 12 to 16 weeks of age. Revaccinate breeders at selection time	Isolate infected birds. No treatment for natural outbreak.
Loss of appetite and diarrhea (3 to 24 weeks)	Hemorrhagic and Non-specific Enteritis (unknown)	General sanitation recommendations	Use recommended antibiotic according to manufacturer's directions—250 grams per ton

TABLE 4.—Weights, Body Conformation and Feed Conversion of Three Varieties of Turkeys at 24 Weeks of Age[1]

Variety	Sex	Body weight (lbs.)	Shank length (inches)	Keel length (inches)	Body depth (inches)	Breast width (inches)	Feed/ bird (lbs.)
Broad Breasted Bronze[2]	M	21.9	7.8	7.2	8.9	4.4	(3.7
	F	14.2	6.3	6.2	7.2	3.9	(
Large Whites[3]	M	19.5	7.8	7.1	8.7	3.8	(3.8
	F	12.5	6.3	6.1	7.0	3.6	(
Small Whites[4]	M	14.8	6.8	6.2	7.8	3.4	(4.0
	F	8.8	5.3	5.0	6.0	3.2	(

[1] Ohio Farm and Home Research, Vol. 41, Mar.-Apr. and May-June, 1956.
[2] Average of 2 strains.
[3] Average of 4 strains.
[4] Average of 2 strains.

TABLE 5.—Ohio Turkey Starter[1]

Ingredients	Pounds
Corn, ground yellow	337
Middlings, standard or ground wheat	50
Soybean oil meal (44% protein)	400
Meat scrap (50% protein)	50
Alfalfa, dehydrated (17% protein)	60
Fish meal (58% protein) or fish solubles	40
Rock phosphate, defl. or steamed bone meal	22
Limestone	12
Iodized salt	4
Manganese sulfate	0.25
Dried whey or dried buttermilk	25

Additives per 1000 lbs. of Mash

Vitamin A. I.U.	2,000,000
Vitamin D_3, I.C.U.	800,000
Riboflavin, gm.	2
Calcium pantothenate, gm.	250
Niacin, gm.	15
Choline chloride, gm.	250
Procaine penicillin, gm.	4

[1] Ohio Agric. Ext. Bul. 343.

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